

# NASA News

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## SPACE SATELLITE TO AID ARTIC OIL DEVELOPMENT

A space satellite project that could have far-ranging impact on oil recovery operations in arctic regions will get underway soon.

A small company in Santa Barbara, Calif., Polar Research Laboratory, is rushing to completion the fabrication of 16 air-dropable data collection platforms (DCPs) to be used in conjunction with NASA's polar-orbiting Nimbus-6 weather satellite. The DCPs will report on the movement of the arctic ice pack in the Beaufort Sea just north of Alaska's oil-rich Prudhoe Bay area.

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TO AID ARCTIC OIL DEVELOPMENT (NASA) 7 P  
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If the project is successful, two firsts will have been achieved -- the first day-to-day tracking of ice pack movement in that area and the first successful air drop of DCPs on ice.

The Nimbus project is the responsibility of Goddard Space Flight Center, Greenbelt, Md., and the DCP development is being supervised by the National Oceanic and Atmospheric Administration's Data Buoy Office, Bay St. Louis, Miss., for the Interior Department's Bureau of Land Management. Scientists who will use the DCPs are from the University of Washington's Arctic Ice Dynamics Joint Experiment project office. General Electric is the Nimbus prime contractor.

The new platforms were designed to meet specifications for the Nimbus-6 onboard Random Access Measurement System, which is capable of contacting and receiving data from more than 1,000 fixed or moving platforms. The system was developed by Texas Instruments, Dallas.

Tracking of polar ice is important for many reasons. In the Beaufort Sea area, especially, it is important to know how the winter sea ice interacts with the continental shelf. In addition, during the summer, information on why, where and how much ice melts is important.

Known deposits of oil and gas in the Prudhoe Bay land area are 9.6 billion barrels of oil and 26 trillion cubic feet of gas. Another 5 to 16 billion barrels of oil and 14 to 49 trillion cubic feet of gas, still to be tapped, is believed present on the north slope. Estimates of oil and gas along the continental shelf that extends out into the Beaufort Sea range from 2 to 19 billion barrels of oil and from 5 to 50 trillion cubic feet of gas.

It is not known how the ice pack piles up and how far down toward the bottom along the shelf it may reach; precisely where deep arctic water meets the shallow continental shelf; how fast the ice moves in deep water or how close and how fast it moves toward the shore; where and how much it melts during the short arctic summer; and many other aspects of the ice pack that have never been monitored on a day-to-day basis.

This knowledge is important to government and industry alike. Government must know as much as possible about the continental shelf to allocate intelligently drilling areas and oversee their use by private industry.

Oil companies want to know the same things for their own exploration plans and to comply with environmental and ecological laws.

For example, pressure ridges -- the accumulation of sea ice in specific areas of the pack that often extend under water to 100 feet or more -- could be dangerous to underwater pipelines. If water on the shelf area is shallow, such a ridge could plow up a furrow in the ocean floor destroying any pipelines or oil rigs in the area. If DCPs, transmitting information daily on sea ice movement, detect that a portion of the pack moves only very slowly or stops, this could indicate ice plowing.

It is also important to know how much the ice moves in the winter and melts in the summer so oil companies can decide whether it is feasible to put a drilling rig on top of the ice or sink its legs into the sea bed underneath.

Such information also is needed to decide whether to try to bury pipelines under the ocean floor, lay them along the bottom or run them over the ice pack to shore or to an ice-free area for loading on a tanker.

Because of the extreme weather conditions in the arctic and its cyclic nature it is necessary to develop a cost-effective way of collecting daily data for months and even years in temperatures as low as 50 below zero Fahrenheit. It is estimated this first group of DCPs will cost about \$6,000 each with later ones costing as little as \$2,000 or \$3,000. The cost of such wide-scale coverage any other way is prohibitive.

This new type of platform is being made so that it can be dropped by parachute from a small aircraft to the ice pack surface where a foam impact cushion will absorb the landing shock and a shroud cutter will release the chute.

A new type inorganic lithium battery which will power the DCP is designed to function in the severe arctic weather for at least eight months.

The DCP itself is housed in a Lexan sphere with the batteries and electronics resting on Teflon bearings. No matter how it is canted after striking the surface, the interior portion, resting on the Teflon bearings, will right itself so the antenna is pointed toward the satellite as it comes over the arctic.

The data will be transmitted to Nimbus-6 which was launched from the Western Test Range, Lompoc, Calif., last June, and relayed to ground stations in Alaska or North Carolina either directly or after being tape recorded. From the tracking station it goes to Bay St. Louis for analysis.

Principal investigator for the polar DCPs, Beaumont M. Buck, President of the Polar Research Laboratory, says one of the hazards to the DCPs in the arctic is the polar bear. He says this arctic native is extremely curious and usually hungry. As a result, it will attempt to chew on most anything that appears different from the natural surroundings.

With this in mind, the exterior of the DCP is a tough Lexan sphere which a bear would find difficult to bite.

A photograph to illustrate this news release will be distributed without charge only to media representatives in the United States. It may be obtained by writing or phoning:

The Public Affairs Audio-Visual Office  
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# AIR-DROPABLE DATA COLLECTION PLATFORM

